


PRE-APPEAL BRIEF REQUEST FOR REVIEW		Docket Number (Optional) M4065.0369/P369-A	
		Application Number 10/006,704-Conf. #3229	Filed December 10, 2001
		First Named Inventor Shane J. Trapp	
		Art Unit 1765	Examiner E. L. T. Umez
<p>Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.</p> <p>This request is being filed with a notice of appeal.</p> <p>The review is requested for the reason(s) stated on the attached sheet(s). Note: No more than five (5) pages may be provided.</p> <p>I am the</p> <p><input type="checkbox"/> applicant/inventor.</p> <p><input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)</p> <p><input checked="" type="checkbox"/> attorney or agent of record. Registration number <u>28,371</u></p> <p><input type="checkbox"/> attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34. _____</p> <p>NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.</p> <p><input type="checkbox"/> *Total of <u>1</u> forms are submitted.</p>			

  
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August 30, 2007  
Date

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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In re Patent Application of: Shane J. Trapp

Application No.: 10/006,704

Confirmation No.: 3229

Filed: December 10, 2001

Art Unit: 1765

For: METHOD AND COMPOSITION FOR  
PLASMA ETCHING OF A SELF-ALIGNED  
CONTACT OPENING

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Examiner: L. T. Umez Eronini

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

MS AF  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**INTRODUCTORY COMMENTS**

Applicants respectfully request a review of the legal and factual bases for the rejections in the above-identified patent application. Pursuant to the guidelines set forth in the Official Gazette Notice of July 12, 2005 for the Pre-Appeal Brief Conference Program, favorable reconsideration of the subject application is respectfully requested in view of the following remarks.

Claims 26 and 77-82 are pending in the application. Claims 26, 77, 78, 81, and 82 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,976,222 (“Yang”). This rejection is respectfully traversed. The Office Action fails to establish a *prima facie* case of obviousness at least because Yang does not teach or suggest every element of independent claims 26, 77, and 78. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Claim 26 recites, a “plasma etching composition” comprising “at least two fluorocarbons and ammonia, wherein said at least two fluorocarbons and said ammonia form a reactive mixture,

and wherein said at least two fluorocarbons are selected from the group consisting of fluorohydrocarbons, chlorofluorocarbons, and chlorofluorohydrocarbons.” Applicant respectfully submits that Yang does not teach or suggest these limitations. To the contrary, Yang only discloses “a fluorochemical containing exhaust gas from a semiconductor fabrication facility.” (column 7, lines 5-6). Applicant respectfully submits that an exhaust gas from semiconductor fabrication facility is not a plasma etching composition.

Yang teaches that the “fluorochemical containing exhaust gas [is] from a semiconductor fabrication facility conducting an etch or clean process step...comprising a diluent gas, such as nitrogen, and fluorochemicals comprising potentially NF<sub>3</sub>, SF<sub>6</sub>, CF<sub>4</sub>, CHF<sub>3</sub>, CH<sub>3</sub> F, C<sub>2</sub> F<sub>6</sub>, C<sub>2</sub> HF<sub>5</sub>, C<sub>3</sub> F<sub>8</sub>, C<sub>4</sub> F<sub>8</sub>, HF, F<sub>2</sub> and mixtures of these gases” and that “[a]dditional components in this mixture include; CO, CO<sub>2</sub>, H<sub>2</sub>O, O<sub>2</sub>, CH<sub>4</sub>, SiF<sub>4</sub>, SiH<sub>4</sub>, COF<sub>2</sub>, N<sub>2</sub> O, NH<sub>3</sub>, O<sub>3</sub>, Ar, Br<sub>2</sub>, BrCl, CCl<sub>4</sub>, Cl<sub>2</sub>, H<sub>2</sub>, HBr, HCl, He, and SiCl<sub>4</sub>.” (column 7, lines 5-14, emphasis added). The Office Action states that “it would have been obvious...to select any combination etchant gases as taught in the Yang reference, including Applicants’ claimed etchants that would effectively accomplish the disclosed composition because these etchants gasses are used for etching and cleaning operations in the fabrications of various electronic materials.” (Office Action, page 3). Applicant respectfully disagrees with this statement.

Yang teaches that the exhaust gas components may be from an “etch or clean process step” and therefore does not teach which of the listed components could be used in an etch process or which could be used in a clean step. Furthermore, Yang teaches that the exhaust gas is from an entire semiconductor fabrication facility, which are known to combine waste streams from multiple etch and clean processes running at any given time. Therefore, Yang does not teach which, if any, of the listed components could be used in combination together or for what purpose. Because Yang does not specify which of the components may actually be used in an etching step, Yang does not teach that any of the three components selected by the Office Action from Yang’s list of components may be used in an etching step, alone or in combination. Therefore, Yang does not teach or suggest all the claim limitations of claim 26, and the Office Action has not established a *prima facie* case for obviousness, with respect to claim 26.

Furthermore, the Supreme Court recently held in *KSR Int'l Co. v. Teleflex Inc.* that “the [Graham] factors continue to define the inquiry that controls” a finding of obviousness and reiterated that a “patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art.” 127 S. Ct. 1727, 1734 (U.S. 2007). This is exactly what the present Office Action proposes in the current rejection over Yang. As discussed above, Yang teaches an exhaust stream from a semiconductor fabrication facility that potentially comprises the components “NF<sub>3</sub>, SF<sub>6</sub>, CF<sub>4</sub>, CHF<sub>3</sub>, CH<sub>3</sub> F, C<sub>2</sub> F<sub>6</sub>, C<sub>2</sub> HF<sub>5</sub>, C<sub>3</sub> F<sub>8</sub>, C<sub>4</sub> F<sub>8</sub>, HF, F<sub>2</sub>,” “CO, CO<sub>2</sub>, H<sub>2</sub>O, O<sub>2</sub>, CH<sub>4</sub>, SiF<sub>4</sub>, SiH<sub>4</sub>, COF<sub>2</sub>, N<sub>2</sub> O, NH<sub>3</sub>, O<sub>3</sub>, Ar, Br<sub>2</sub>, BrCl, CCl<sub>4</sub>, Cl<sub>2</sub>, H<sub>2</sub>, HBr, HCl, He, and SiCl<sub>4</sub>.” Further, as discussed above, Yang does not disclose which components may be used in etch steps and which may be used in clean steps, nor which, if any, components may be used in combination. Therefore, Yang only discloses a laundry list of components that are known independently in the prior art and that may be used for some purpose (not necessarily an etch step) in a semiconductor fabrication facility.

From this laundry list of known components, the Office Action states that “it would have been obvious...to select any combination etchant gases as taught in the Yang reference, including Applicants’ claimed etchants that would effectively accomplish the disclosed composition.” (Office Action, page 3, emphasis added.) This statement is a clear admission of the use of inappropriate hindsight because the reason the Office Action gives for combining the components is to anticipate the Applicant’s claims. The Office Action also states that it would have been obvious to select any combination of components “because these etchants gasses are used for etching and cleaning operations in the fabrications of various electronic materials.” (Office Action, page 3). This statement is a mere truism, and does not provide a reason to combine the components. Also, combining independently known components is clearly forbidden by the holding of *KSR* as described above. *Id.*

Furthermore, the reasoning given by the Office Action is not a proper substitution of an analysis of the claims under the Graham Factors. The Graham factors include determining the scope and content of the prior art, ascertaining differences between the prior art and the claims at issue, and resolving the level of ordinary skill in the pertinent art. *Graham v. John Deere*, 383 U.S.

1, 148 USPQ 459 (1966). “Patent examiners carry the responsibility of making sure that the standard of patentability enunciated by the Supreme Court and by the Congress is applied in each and every case.” *MPEP* 2141.

The facts of the case at hand are very similar to those of *United States v. Adams*, the *Graham* companion case, in which the court found a combination of components in a patented battery to be nonobvious despite the fact that the individual components of the patented battery were known for use in batteries. 383 U.S. 39 (1966). In fact, the claims at issue in this case present an even stronger case against obviousness than those of *Adams* because the Office Action has failed to show that the components listed by Yang are actually known to be useful in an etching step.

Since the Office Action has not established a *prima facie* case of obviousness, claim 26 is not obvious over the cited reference. Applicant also submits that claims 77 and 78 are allowable for reasons similar to the reasons given above with respect to claim 26. Claim 82 depends from claim 26 and is patentable at least for the reasons mentioned above. Claims 81 depends from claim 78 and is patentable at least for the reasons mentioned above. Applicant respectfully requests that the rejection be withdrawn and the claims allowed.

Claims 79 and 80 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yang in view of U.S. Patent No. 6,277, 733 (“Smith”). This rejection is respectfully traversed. Claim 79 and 80 depend from claim 78 and are allowable over Yang for the reasons set forth above. Smith does not cure the deficiencies of Yang.

Furthermore, it would not be obvious to combine the fluorocarbons taught by Smith with the exhaust gas taught by Yang because Smith teaches away from the combination. In *KSR*, the Court reiterated the importance of secondary considerations to the *Graham* factors, when it cited with approval its own holding in *United States v. Adams*, 383 U.S. 39, 40, 86 S. Ct. 708, 15 L. Ed. 2d 572, 174 Ct. Cl. 1293 (1966), in which the Court “relied upon the corollary principle that when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious.” *Id.* at 720.

Smith discloses a plasma composition containing fluorocarbons used for “a clean up step.” (column 4, lines 41-42). Smith further discloses that “this step will neither oxidize any exposed portions of underlying oxygen sensitive conductor 420, nor will it substantially etch any exposed portions of silicon nitride.” (column 4, lines 43-46). The Office Action states that the motivation to combine a specific component of the cleaning step of Smith with the alleged composition of Yang would be “for the purpose of removing hydrocarbon residue left on the metal structure.” (Office Action, page 4). Applicant respectfully submits that this statement would not provide motivation to combine, and actually teaches away from combining components of the cleaning gas of Smith with the exhaust gas of Yang.

Components that are suitable for cleaning a material are generally not suitable for etching the same material. An etchant is used to etch or cut a particular material, while a cleaning composition is used to remove residue and debris and therefore must not etch or cut the same material. Therefore, it would not be obvious to combine a cleaning composition with an etching composition. Furthermore, etching steps and cleaning steps are performed separately. Etching steps are performed to etch a material and cleaning steps are performed to remove residue left over from the etching. These steps cannot be performed concurrently because the etching residue would not be completely removed.

Thus, even assuming *arguendo* that it would have been obvious to somehow combine, without any logical reason to do so, some components from the exhaust gas of Yang to form a “plasma etching solution,” combining an etching solution of Yang with a cleaning component of Smith would not result in a combined etching and cleaning step, but instead would dilute the etching component and result in reduced functionality. Therefore, it would not be obvious to combine the components from the cleaning solution of Smith with the alleged etching solution of Yang and one of ordinary skill in the art would be motivated not to combine the two. Accordingly, Applicant respectfully requests that the rejection of claims 79 and 80 be withdrawn and the claims allowed.